



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

h's

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/667,632

09/22/2003

Hui-Ling Lou

MP0318

1163

26703 7590 03/29/2007
HARNES, DICKEY & PIERCE P.L.C.
5445 CORPORATE DRIVE
SUITE 200
TROY, MI 48098

EXAMINER

TRAN, KHAI

ART UNIT

PAPER NUMBER

2611

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
----------------------------------------	-----------	---------------

3 MONTHS

03/29/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/667,632	Applicant(s) LOU ET AL.	
	Examiner KHAI TRAN	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-78 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-19, 22-33, 36-46, 49-58, 61-70 and 73-78 is/are rejected.
- 7) ☒ Claim(s) 4-5, 20-21, 34-35, 47-48, 59-60, 71-72 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>4 sheets</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claims 14, 41, and 66 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 14, the term "said constellation points" lacks antecedent basis as set forth in claims 41, 66.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 6-8, 10-15, 16-19, 22-23, 25-30, 31-33, 36-42, 43-46, 50-55, 56-58, 62-67, 68-70, 73, 78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al (U.S. Pat. 5,602,601) in view of El-Gamal et al (US 2002/0136327).

Regarding claim 1, Kim et al disclose a phase error corrector for an HDTV reception system as shown in Figures 1-5, comprising a demodulator that generates a demodulated symbol sequence by derotating a signal constellation of a symbol sequence (see Figure 1 showing a receive signal from an antenna and processed by demodulator); a dimension demultiplexer (see Figure 5, a demultiplexer 15 and a complex demultiplexer 18) that communicates with the demodulator and that generates

Art Unit: 2611

in-phase and quadrature components of the demodulated symbol sequence. Kim et al fail to disclose a space-time block decoder for a wireless communication system.

El-Gamal et al disclose a communication system comprising a receiver having a space-time decoder 305 as shown in Figure 3, for reconstructing the original source message. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the a space-time decoder as taught by El-Gamal et al into the teachings of Kim et al in order to maximize spatial and temporal diversity.

Regarding claim 2, Kim et al disclose a slicer (see Figure 5) that communicates with the demultiplexer.

Regarding claim 3, El-Gamal et al disclose a receiver (300) that communicates with the space-time block decoder individually decodes symbols in the received symbol sequence.

Regarding claim 6, Kim et al disclose one receiver antenna in a receiver (see figure 1).

Regarding claim 7, Kim et al disclose wherein the receive antenna receives two symbol during first and second consecutive symbol period (col. 2, line 53 to col. 6, line 45).

Regarding claim 8, El-Gamal et al disclose the space-time decoder further comprising a receiver that communicates with the space-time block decoder and that includes at least two receive antennae (see Figure 3, antennae 303-1 to 303-L).

Regarding claim 10, El-Gamal et al disclose wherein the signal constellation is generated by a quadrature phase shift keying code (QPSK, see [0048]).

Regarding claims 11-12, the implementation of the space-time block decoder in a wireless metropolitan area network is well known in the wireless networking system. It would have been obvious to one having ordinary skill in the art at the time the invention was made to implement the space-time decoder in the wireless metropolitan area network and wireless local area network (WLAN) into the wireless communication system as taught by El-Gamal et al in order to provide multiple services to users such as banking, home-shopping, education ...

Regarding claims 13-14, El-Gamal et al disclose mapping step used by constellation points for performing modulation (see [0034]). El-Gamal et al fail to disclose the constellation points are Gray coded. However, the use of Gray code for constellation is well known in the art for mapping constellation points.

Regarding claim 15, El-Gamal et al also disclose a bit mapping module that communicates with the slicer and that maps the constellation points to user data bits (see [0034]).

Claims 16-19, 22 are similar to claims 1-3, 6. Therefore, claims 16-19 are rejected under a similar rationale.

Claims 23, and 25-30 are similar to claims 8, 10-15. Therefore, claims 23, 25-30 are rejected under a similar rationale.

Claims 31-33, and 36-42 are similar to claims 1-3, 10-15. Therefore, claims 31-33, 36-42 are rejected under a similar rationale.

Claims 43-46, and 50-55 are similar to claims 16-19, 25-30. Therefore, claims 43-46, 50-55 are rejected under a similar rationale.

Art Unit: 2611

Claims 56-58, and 62-67 are similar to claims 1-3, 10-15. Therefore, claims 56-58, 62-67 are rejected under a similar rationale.

Claims 68-70, 73-78 are similar to claims 1-3, 10-15. Therefore, claims 68-70, 73-78 are rejected under a similar rationale.

4. Claims 9, 24, 36, 49 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al in view of Bauch (US 2006/0274846 A1).

Regarding claim 9, Kim et al fail to disclose wherein at least one symbol in the received symbol sequence is encoded with an orthogonal space-time code.

Bauch discloses a reception diversity comprising at least one symbol in the received symbol sequence is encoded with an orthogonal space-time code (see abstract, [0096]). It would have been obvious to one having ordinary skill in the art at the time the invention was made to encode the received signal with the orthogonal space-time code as taught by Bauch into the teachings of Kim et al in order to overcome restrictions implied through unit length requirements for previously known differential transmit diversity schemes from orthogonal design.

Claim 24 is similar to claim 9. Therefore, claim 24 is rejected under a similar rationale.

Claim 36 is similar to claim 9. Therefore, claim 36 is rejected under a similar rationale.

Claim 49 is similar to claim 9. Therefore, claim 9 is rejected under a similar rationale.

Claim 61 is similar to claim 9. Therefore, claim 61 is rejected under a similar rationale.

Allowable Subject Matter

5. Claims 4-5, 20-21, 34-35, 47-48, 59-60, 71-72 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kroeger (U.S. Pat. 7,043,681) discloses a digital audio broadcasting method and apparatus using complementary pattern mapped convolutional codes.

Wallace (US.2003/0223353) discloses a method and apparatus for decoding baseband OFDM signals.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KHAI TRAN whose telephone number is (571) 272-3019. The examiner can normally be reached on 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JAY PATEL can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2611

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



KHAI TRAN
Primary Examiner
Art Unit 2611

KT
March 27, 2007